

SEQUENCE LISTING

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Ulrike Schön
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<120> RETROVIRAL EXPRESSION VECTORS ON THE BASIS OF
HERV-LONG TERMINAL REPEAT SEQUENCES

<130> 10737-006001

<150> PCT/EP00/02064

<151> 2000-03-09

<150> DE 199 10 650.9

<151> 1999-03-10

<160> 47

<170> PatentIn Ver. 2.1

<210> 1

<211> 375

<212> DNA

<213> Human endogenous retrovirus

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<213> Human endogenous retrovirus

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<210> 6
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<210> 7
<211> 393
<212> DNA
<213> Human endogenous retrovirus

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<400> 7

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<210> 8

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<212> DNA

<213> Human endogenous retrovirus

<400> 8

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ctgcccacca gagaacagac ccctttgact gtaattttcc attaccttcc caaatcctat 300
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<210> 9

<211> 388

<212> DNA

<213> Human endogenous retrovirus

<400> 9

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<210> 10

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<212> DNA

<213> Human endogenous retrovirus

<400> 10

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attccaccat tgtgatttggt tctgcccc aacctactga taccatatat tcttcccccg 180
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<210> 11

<211> 309

<212> DNA

<213> Human endogenous retrovirus

<400> 11

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caccattgtg atttgttctt gccccacgt aactgatacc atatattctt cccccgcct 180
tgagaatgta ctttgtacac ctatcccaaa cctataagaa ctaatgataa tccaccaccc 240
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<210> 12

<211> 314

<212> DNA

<213> Human endogenous retrovirus

<400> 12

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cccttgagaa tgtactttgt acacctatcc caaacctata agaactaatg ataatoctac 240
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<210> 13

<211> 341

<212> DNA

<213> Human endogenous retrovirus

<400> 13

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<210> 14

<211> 341

<212> DNA

<213> Human endogenous retrovirus

<400> 14

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catatctgac caatcaggta gtaaagagag ctactaaaa tgctaattag gctaaaacag 180
gaggcaaaga agtagccaat catctgttgc ctgacagcac agcaggaggg acaatgatcg 240
ggatataaac ccaggcattc gagccagcta cagctaccct ctttgggtcc cctccctttg 300
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<210> 15

<211> 322

<212> DNA

<213> Human endogenous retrovirus

<400> 15

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cacacttgac cagtcaggta gtaaagagag ctactaaaa tgctaattag gctaaaacag 180
gaggtaaaga aatagacaat catctatcac ctgagagcac agtgggaggg acaatgatcg 240
gcatataaac ccaggcattc gagccagcaa cagcaacccc ctttgggagc tctgttttca 300
ctctattaaa tcttgcaact gc 322

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<210> 16

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 16

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cacacccaac caatcaggta gtaaagagag cttgctaaaa tgctaattag gcaaaaacag 180
gaggtaaaga aatagccagt catctatcgc ctgacagcac aaggggcggg acaatgatca 240
ggatataaac tcaggcattc aagccagcaa tggctaccca ctttgggtcc cctcccattt 300
tatgggagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 17

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 17

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gaggtaaagg aacagccagt catctatcgc ctgacagcac aaggggcggg acaatgatca 240
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<210> 18

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 18

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cacacccgac caatcaggta gtaaaggagg ctactaaaa tgctaattag ggaaaaacag 180
gaggtaaaga agtagccaat catctatcgc ctgagagcac aacaggaggg acaatgatca 240
ggatataaac ccaggcattc aagccagcgg tggctacctt ctttgggtcc cctcccattt 300
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<210> 19

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 19

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<210> 20

<211> 343

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<213> Human endogenous retrovirus

<400> 20

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<211> 343

<212> DNA

<213> Human endogenous retrovirus

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gaggtaaaga aatagccagt catctatcgc ctgacagcac aaggggcggg acaatgatca 240
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tatgggagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 22

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 22

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cacacccgac caatcaggta gtaaagagag cttgctaaaa tgctaattag gcaaaaacag 180
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<210> 23

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 23

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cacacccgac caatcaggta gtaaaggag ctcactaaaa tgctaattag ggaaaaacag 180
gaggtaaaga agtagccaat catctatcgc ctgagagcac aacaggaggg acaatgatca 240
ggatataaac ccaggcattc aagccagcgg tggctaccct ctttgggtcc cctccctttg 300
tatggaagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 24

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 24

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ggatataaac ccaggcattc gagccggcaa cgactaccct ctttgggtcc cctccctttg 300
tatgggagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 25

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 25

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ggatataaac tcaggcattc aagccagcaa tggctaccct ctttgggtcc cctcccattt 300
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<210> 26

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 26

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ggatataaac ccaggcattc gagccggcaa cgactaccct ctttgggtcc cctccctttg 300
tatgggagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 27

<211> 619

<212> DNA

<213> Human endogenous retrovirus

<400> 27

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<210> 28
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<212> DNA
<213> Human endogenous retrovirus

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<400> 28
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ttgtctcaac tgcaagaggc attccttcct cttatactaa tcctcctcag cacagaccct 180
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gattaacaga atctcaaggc agaagaattt ttcttaacac ataacaaaat ggagtctccc 540
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<210> 29
<211> 624
<212> DNA
<213> Human endogenous retrovirus

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<400> 29
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ttgtctcaac tgcaagaggc attccttcct cttatactaa tcctcctcag cacagaccct 180
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gccttcgcga gtttttgtgt cctgggtact tgagattagg gagtgggtgat gactcttaag 360
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tttccccctt ttcttttcga caaa                                     624

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<210> 30
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<212> DNA
<213> Human endogenous retrovirus

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<400> 30
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actatcacat ggggagaaac cttggacaat acctggcttt cctaggcaga ggtccctgcg 300
gccttcgcga gtttttgtgt cctgggtact tgagattagg gagtgggtgat gactcttaag 360
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gattaacaga atctcaaggc agaagaattt ttcttaacac ataacaaaat ggagtctccc 540
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<210> 31
<211> 672
<212> DNA
<213> Human endogenous retrovirus

```

```

<400> 31
gtcccacctc cagccctaag gcgggtttttc cctatctcag tagatggagc atacaatcgg 60
gttttataacc gagacattcc attgcccagg gacaggcagg agacagatgc ctctctcttg 120
tctcaactgc aagaggcatt ccttcctctt atactaatcc tcctcagcac agacccttta 180
cgggtgtcgg gctggggggac ggtcagggtct ttccttccc acgaggccat atttcagact 240
atcacatggg gagaaacctt ggacaatacc tggttttctt aggcagaggt ccctgcggcc 300
ttcgcagtt tttgtgtcct ggggtacttg gattagggag tggatgatgac tcttaaggag 360
catgctgcct tcaagcatct gtttaacaag gcacatcctg caccgccctt aatccattca 420
accctgagtt gacacgcac acgtttcaga gagcacgggg ttgggggtaa ggtcatagat 480
taacagaatc tcaaggcaga agaatttttc ttaacacata acaaaatgga gtctcccatg 540
tctacttctt tctacacaga cacagtaaca atctgatccc tcttgctttt cccacattt 600
cccccttttc ttatccatca cactggcggc cgctcgagca tgcatctaga gggcccaatt 660
cgccctatag tg 672

```

```

<210> 32
<211> 593
<212> DNA
<213> Human endogenous retrovirus

```

```

<400> 32
agtagatgga gcatacaatc ggggttttata ccgagacatt ccattgcccga gggacaggca 60
ggagacagat gccttcctct tgtctcaact gcaagaggca ttccttcctc ttttactaat 120
cctcctcagc acagaccctt tacagggtgtc gggctggggg acggtcagggt ctttcccttc 180
ccacgaggcc atatttcaga ctatcacatg gggagaaacc ttggacaata cctggctttc 240
ctaggcagag gtccctgcgg ccttctgcag tttttgtgtc cctgggtact tgagattagg 300
gagtgggtgat gactcttaag gagcatgctg ccttcaagca tctgtttaac aaagcacatc 360
ctgcaccgcc cttaatccat tcaaccctga gttgacacag cacatgtttc agagagcacg 420
gggttggggg taaggtcata gattaacaga atctcaaggc agaagaattt ttcttagcac 480
ataacaaaat ggagtctcct atgtctactt ctttctacac agacacagta acaatttgat 540
ctctcttgct tttccccaca tttccccctt ttcttttoga caaaaccgcc atc 593

```

```

<210> 33
<211> 943
<212> DNA
<213> Human endogenous retrovirus

```

```

<400> 33
tgtgggagaa ggattacca ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60

```

```

ataatataga aaatagctag aataagaata gttataataa aaattagata tacacatgat 120
catggacatt accaatcatt actacaaaca ttgttaatca ttagctttta atattactct 180
ttgttttatt actaatataa ccaaggaata accggtagca tacggtcagg tgctgaaggg 240
acattgtgag aagtgaacct gaaggcaaga ggtgagcctt ctgtcacgcc tgcataagga 300
cagcttgagg gctccttggc caagctgtaa caccagtgcc tgggaaggca ccgttactta 360
gcagaccatg aaagggagtc tccattcctt ggaggagtca gggaaacact atgctccacc 420
agcttcttgt gtatccagcc ctgcccacag tcatccagag gcataaaccc ctccctgtgg 480
tgctgtgctt caatggccat gcttcttgtc cactttcatg ttctctctgt actcctggtt 540
cctctttgaa gttcgtagaa gataatggta gaagaaatag tgaaagtctt tgatctttct 600
tataagtgca tagaagaaaa cactgatgta tgctgcctt cctctctgc ttcagctacc 660
taaaaggaaa ggcccccttt cccatgatca catgacttgc ctgaccttat caatcacttg 720
gaggactcac cctccttacc ctgtcccttt gtcttgtatg caataaatat cagcacgccc 780
agccattcgg ggccactact ggtctccgca acttggtggg agtggtaccc tggggccagc 840
tgttttctct ttatctcttt tgtcttgtgt ctttatttct tacaatctct catctctgca 900
catggggaga acaccggcaa agcccgtagg gctggacctt aca 943

```

<210> 34

<211> 389

<212> DNA

<213> Human endogenous retrovirus

<400> 34

```

aaacccctcc ctgtggtgct gtgcttcaat ggccatgctt cttgtccact ttcatgttcc 60
tctgtacttc ctggttccctc tttgaagttc gtagaagata atggtagaag aaatagttaa 120
agtctttgat ctttcttata agtgcataga agaaaacact gatgtatgcc tgccttccct 180
ctctgtctca gctacctaaa aggaaaggcc cctttccca tgatcacatg acttgctga 240
ccttatcaat cacttgagg actcacctc cttaccctgt ccttttgtct tgtatgcaat 300
aaatatcagc acgcccagcc attcggggcc actactggtc tccgcaactt ggtggtagtg 360
gtaccctggg cccagctggt ttctcttta 389

```

<210> 35

<211> 858

<212> DNA

<213> Human endogenous retrovirus

<400> 35

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tgtgggcgga agagtacctt ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaga aaatagaata agaatagtca taatacaaat tagatacagc gatgatcatg 120
aacaattatc catcattatt ataaacatta ttaatcatta gcttttaata ttactctgtt 180
gcattaataa tataacctag gaataaccgg caggtatagg gtcagggtgct gaagggacat 240
tgtgagaagt gaatagaagg caagagggga gccttctgtc atgcccgcac aagggccgct 300
tgaaagggccc ttggtcaagc ggtaacgcca gtgtctggga aggcacccgt tactgagcag 360
accgggaaag ggagtctcct ttccttgagg gagtcaggga acgctctgct ccaccagctt 420
cttgtgggag gctggatggt acccaggcct gcctgcagtc atccggaggc ctgaacccct 480
cctgtgggtg cttcaatggt cacgttcctt gtccacttcc atgtccttc cgtactcctg 540
gttctctctt gaagttcgta gtagatagcg gtagaagaaa tagtgaaagt cttaaagtct 600
ttgatcttat aagttcatag aagaaaacgc tgatgcctgc cgccttctct ctctgcttca 660
gctacctaa agggaagggc ccgctgtcct gtgatcagg gacttgcttc acctgtcaa 720
tcacttagaa gactgacct cttatcctg ccccttctgc ttgtatgcaa taaatatcag 780
cgagcccagc cgttcagggc cactaccggt ctccgtgtct ttgtggtagt ggtccccggg 840
cccagctggt ttctcttt 858

```

<210> 36

<211> 386

<212> DNA

<213> Human endogenous retrovirus

<400> 36

```

gaacccctcc ctgtggtgct tcaatggtca cgttccttgt ccactttcat gtcctttccg 60
tactcctggt tcctctttga agttcgtagt agatagcggg agaagaaata gtgaaagtct 120
taaagtcttt gatcttataa gttcatagaa gaaaacgctg atgcctgccg ccttctctct 180
ctgcttcagc tacctaagag ggaaggggccc gctgtcctgt gatcagggtga cttgcttcac 240
cttgtcaatc acttagaaga ctgacctcc ttatcctgcc cccttgtctt gtatgcaata 300
aatatcagcg agcccagccg ttcaggggcca ctaccgggtct ccgtgtcttt gtggtagtgg 360
tccccggggc cagctgtttt ctctttt                                     386

```

<210> 37

<211> 844

<212> DNA

<213> Human endogenous retrovirus

<400> 37

```

tgtgggtgga ggattaccca ggtgccaaagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaaa aaatagaata agaatagtca taatacaaat tagatataga gatgatcatg 120
gacaattagc aatcactatt aatcttttagc ttttaatat actctttgtt gcattactaa 180
tataacctag gaataaccgg tgggtatagg gtcagggtgct gaagggacat tgtgtgaagt 240
gacctggaag gcaagaggtg agccctctgt caccggcaca taaggggccg ttgagggtc 300
cttgggtcaag tggtaacgcc agtgtctggg aatgcacccg ttaattagca gaccgcgaaa 360
gggagtctcc tttccttgga agagttgggg aacactctgc tccaccagct tcttgtggaa 420
ggctggatat tatccaggcc tgcgcgcagt catccggagg cttaaaccct tccctgtggg 480
gctgtgcttc aatgggtocca ctocctgtcc actttcatgc tccctccgta ctctgggtc 540
ctctttgaag agcgcagtag atagcggtag aagaaatagt gaaagtctta aagtcttcga 600
tctttcttac aagtgcagag aagaaaacgc tgacatatgc tgccttccct ctctgcttcg 660
gctacctaaa agggaagggc cgcctatcct gtaatcacat gacttgcttc acctgtcaa 720
tcacttagaa gattcactct ccttaccctg ccccttgctc ttgtatgcaa taaatatcag 780
tgaccccagc cgttcagggc cactactggt ctccgcgtct tgatggtagt ggtcaccgcc 840
gcc                                     844

```

<210> 38

<211> 381

<212> DNA

<213> Human endogenous retrovirus

<400> 38

```

aaacccttcc ctgtggtgct gtgcttcaat ggtcccactc cttgtccact ttcattgctcc 60
tcccgtagtc ctggttcttc tttgaagagc gcagtagata gcggtagaag aaatagtga 120
agtcctaaag tcttcgatct ttcttacaag tgcagagaag aaaacgctga catatgctgc 180
cttccctctc tgcctcggtc acctaaaagg gaaggggcgc ctatcctgta atcacatgac 240
ttgcttcacc ttgtcaatca cttagaagat tcaactctct taccctgcc ccttgtcttg 300
tatgcaataa atatcagtga cccagccgt tcaaggggcac tactgggtct cgcgtcttga 360
tggtagtggg caccgccgcc c                                     381

```

<210> 39

<211> 859

<212> DNA

<213> Human endogenous retrovirus

<400> 39

```

tgtgggtgga ggattacca ggtgccagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaaa aaatagaata agaatagtca taatacaaat tagatataga gatgatcatg 120
gacaattagc aatcactatt aatcttttagc ttttaatat actctttgtt gcattactaa 180
tataacctag gaataaccgg tgggtatagg gtcagggtgct gaaggacat tgtgagaagt 240
gacctggaag gcaagaggtg agccctctgt cacgcccaca taagggccgc ttgagggtc 300
cttgggtcaag tggtaacgcc agtgtctggg aatgcacccg ttaattagca gaccgcgaaa 360
gggagtctcc tttccttgga agagttgggg aacactctgc tccaccagct tcttgtggaa 420
ggctggatat tatccaggcc tgcgcgcagt catccggagg cttaaaccct tccctgtggt 480
gctgtgcttc aatgggtccc ctcttgctc actttcatgc tccctccgta ctctgggtc 540
ctctttgaag agcgcagtag atagcggtag aagaaatagt gaaagtctta aagtcttcga 600
tctttcttac aagtgcagag aagaaaacgc tgacatatgc tgcttccct ctctgcttcg 660
gtacctaaa agggaagggc cgcctatcct gtaatcacat gacttgcttc acctgtgcaa 720
tcacttagaa gattaccct ccttaccctg ccccttctgc ttgtatgcaa taaatatcag 780
tgaccccgagc cgttcagggc cactactggt ctccgcgtct tgatggtagt ggtcaccccg 840
gcccggtgt tttttcttt 859

```

<210> 40

<211> 396

<212> DNA

<213> Human endogenous retrovirus

<400> 40

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aaacccttcc ctgtggtgct gtgcttcaat ggtcccactc cttgtccact ttcattgctcc 60
tcccgtaactc ctgggttcttc tttgaagagc gcagtagata gcggtagaag aaatagttaa 120
agtcttaaaag tcttcgatct tctttacaag tgcagagaag aaaacgctga catatgctgc 180
cttccctctc tgcttcggct acctaaaagg gaaggccgcg ctatcctgta atcacatgac 240
ttgcttcacc ttgtcaatca cttagaagat tcacctcct taccctgccc ccttgtcttg 300
tatgcaataa atatcagtga cccagccgt tcaggggccac tactggtctc cgcgtcttga 360
tggtagtggc caccgcggcc cagggtgttt tctttt 396

```

<210> 41

<211> 966

<212> DNA

<213> Human endogenous retrovirus

<400> 41

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tgtgggtgga ggattacca ggtgccagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaga aaatgggttag aataagaata gtcataatac aaattagata tagagatgat 120
catggacaat tatcaatcat tattataaac attattaatc attagctttt aatattactc 180
tttgttgcat tactaatata acctaggaat aaccgggtgg tatagggtca ggtgctgaaa 240
ggacattggg agaagtgacc tagaaggcaa gaggtgagtc ttctgtcacg cccgcataag 300
ggttgcttga gggctccttg gtcaagtggg aacgcccgtg tctgggaagg cacctgttac 360
ttagccgacc acgaaaggga gtctccttcc cttggaggag tcaggggcga ctctgctcca 420
ccagcttctt gtggaaggct ggatattatc caggcctgcc cgcagtcac cggaggccta 480
aaccctctcc tgtggtgctg tgcttcaatg ggcacactcc tcgtccactt tcatgttctc 540
cccatactcc tggtttctct ttgaagttcg tagtagatag tggtagaagg aatagggaaa 600
atcttaaagt gtttgatctt tcttataagt gcatagaaga aaacgctgac atatgctgcc 660
ttctctgtct gcttcagcta cctaagaggg aagggccccc tgtccagtga tcacgtgact 720
tgcttcacct tgtcaatcac ttagaagatt caccctcctt accctgcccc cttgtcttgt 780
atgcaataaa tatcagtga cccagccttt cggggccact taccggtctc cacgtcttgg 840
tggtagtggc ccccggggc cagctgtttt ctctttatct ctttgtcttg tgtcttattt 900
attacaatct ctctgtctccg cacacagggg gaacaccgcg taagctccgt agggctggac 960
cctaca 966

```

<210> 42
 <211> 398
 <212> DNA
 <213> Human endogenous retrovirus

<400> 42
 aaacccctcc ctgtggtgct gtgcttcaat gggcacactc ctcgccact ttcattgttc 60
 tcccatactc ctggtttctc tttgaagttc gtagtagata gtggtagaag gaatagggaa 120
 aatcttaaag tggttgatct ttcttataag tgcatagaag aaaacgctga catatgctgc 180
 cttctctgtc tgcttcagct acctaagagg gaagggcccc ctgtccagtgc atcacgtgac 240
 ttgcttcacc ttgtcaatca cttagaagat tcacctcct taccctgccc ccttgtcttg 300
 tatgcaataa atatcagtgc acccagcctt tcggggccac ttaccggtct ccacgtcttg 360
 gtggtagtgg tccccgggc ccagctgttt tctcttta 398

<210> 43
 <211> 938
 <212> DNA
 <213> Human endogenous retrovirus

<400> 43
 tgtgggtgga ggattacca ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60
 ataataaaga aaatggttag aataagaata gtcataatac aaattagata tagagatgat 120
 catggacaat tatcaatcat tattataaac attattaatc attagctttt aatattactc 180
 tttgttgcat tactaatata acctaggaat aaccggtggg tatagggtca ggtgctgaag 240
 ggacattggg agaagtgacc tagaaggcaa gaggtgagtc ttctgtcacg cccgcataag 300
 ggttgcttga gggctccttg gtcaagtggg aacgccggtg tctgggaagg cacctgttac 360
 ttagccgacc acgaaaggga gtctcctttc cttggaggag tcagggcaca ctctgtcca 420
 ccagcttctt gtggaaggct ggatattatc caggcctgcc cgcagtcac cggaggccta 480
 aacccctccc tgtggtgctg tgcttcaatg ggcacactcc tcgtccactt tcatgttcct 540
 cccatactcc tggttcctct ttgaagttcg tagtagatag tggtagaagg aatagggaaa 600
 atcttaaagt gtttgatctt tcttataagt gcatagaaga aaacgctgac atatgctgcc 660
 ttctctgtct gcttcagcta cctaagaggg aagggccccc tgtccagtga tcacgtgact 720
 tgcttcacct tgtcaatcac ttagaagatt caccctcctt accctgcccc cttgtcttgt 780
 atgcaataaa tatcagtgc cccagccttt cggkkcactt accggtctcc acgtcttggt 840
 ggtagtggtc ccccggccca gctgttttct ctttatctct ttgtcttggt tcttatttat 900
 tacaatctct cgtctccgca cacagggaga acaccgcg 938

<210> 44
 <211> 396
 <212> DNA
 <213> Human endogenous retrovirus

<400> 44
 aaacccctcc ctgtggtgct gtgcttcaat gggcacactc ctcgccact ttcattgttc 60
 tcccatactc ctggttctc tttgaagttc gtagtagata gtggtagaag gaatagggaa 120
 aatcttaaag tggttgatct ttcttataag tgcatagaag aaaacgctga catatgctgc 180
 cttctctgtc tgcttcagct acctaagagg gaagggcccc ctgtccagtgc atcacgtgac 240
 ttgcttcacc ttgtcaatca cttagaagat tcacctcct taccctgccc ccttgtcttg 300
 tatgcaataa atatcagtgc acccagcctt tcggkkcact taccggtctc cacgtcttggt 360
 tggtagtggg ccccggccc agctgttttc tcttta 396

<210> 45
 <211> 963
 <212> DNA

<213> Human endogenous retrovirus

<400> 45

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tgtgggcgaa agattaccta ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaga aaatagttaa aataagaata gttataatac aaattagata tagagatgat 120
catggacaat tatcaatcat tattataaac attaatacatt agcttttaat attactcttt 180
gttgctttac taatataacc taggaataac cgggtgggtat agggtcaggt gttgacggga 240
tattgtgaga agtgacctag aaggcaagag gtgagccttc tgtcacgccc acataagggc 300
cgcttgaggg ctctttgggc aagtggtaac gccagtgtct gtgaaggcac ctgttactta 360
gcagaccgcg aaagggagtc tcctttcctt ggaggagtca gggaaacactc tgctccacca 420
gcttcttggtg gaaggctgga tattatctag gcctgcccgc agtcatctgg aggcctaaac 480
ccctccctgt ggtgctgtgc ttcagtgggc actctccttg tccactttca tgttcctccc 540
gtactcctgg ttctcttttg aagtctgtag tagatagcag tagaagaaat agtgaaagtc 600
ttaaagtatt tgatctttct tataagtgc tagaagaaaa cgctgacata tgctgccttc 660
tctatctctg cgggtggctac ctaaaagggg agggcccccgt gtcctatgat catgtgactt 720
gcttcacctt atcacttaga agattcatcc tccttacctc gcgccccctc gtcttgatg 780
caataaatat cagcacgccc agtcgtttga ggccactgcc ggtctccgcg tcttggtggt 840
agtgggtccc cggggccagc tattgtctct ttatctcttt gtcttggtgc tttatttatt 900
acaatctctt gtctctgcac acagggagaa cacctgctaa gcccgtagg actggacct 960
aca 963
```

<210> 46

<211> 397

<212> DNA

<213> Human endogenous retrovirus

<400> 46

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aaacccctcc ctgtggtgct gtgcttcagt ggtcactctc cttgtccact ttcattgttc 60
tcccgtaact ctggttcctc tttgaagttc gtagtagata gcagtagaag aaatagtga 120
agtcttaaag tatttgatct ttcttataag tgcatagaag aaaacgctga catatgctgc 180
cttctctatc tctgcggtgg ctacctaaaa ggggaagggc cctgtccca tgatcatgtg 240
acttgcttca ccttatcact tagaagattc atcctcctta cctgcgccc cctcgtcttg 300
tatgcaataa atatcagcac gccagtcgt ttgaggccac tgccggtctc cgcgtcttg 360
tggtagtggc cccccgggccc cagctattgt ctcttta 397
```

<210> 47

<211> 489

<212> DNA

<213> Human endogenous retrovirus

<400> 47

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tgttcaattc tttgccttct acttttaaac ttaacttcct cataaagcaa cctttttcaa 60
tcacctgctc cactctgact cattctgact acctgctcca cctgactca ttccgatcac 120
ctgateccact gtgactcatt ccgattaccc gctccaccct gactcattct gattctgatt 180
tctgctctg ccataaccat tttcccgc aaaccactca cctgtcact ctctttaaat 240
tagccaattg gaattagttt agcctgtgcg gtctaaccct agccaatagg ggactgacac 300
agcagcaggg gccacatgtg tcaggaataa gaccccttc cctccctgt ccagatgtgt 360
gtccaccatt gctccatctg tgagggcaca ccctctata gaagtaaatt gccttgctga 420
gaagaaaaaa aagaacattt tatattcaag tcctatttct tttgctgcac cgaaacttta 480
tttataaca 489
```

<213> Human endogenous retrovirus

<400> 45

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tgtgggagaa agattaccta ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaga aaatagttaa aataagaata gttataatac aaattagata tagagatgat 120
catggacaat tatcaatcat tattataaac attaatcatt agcttttaatt attactcttt 180
gttgctttac taatataacc taggaataac cgggtgggtat agggtcagggt gttgacggga 240
tattgtgaga agtgacctag aaggcaagag gtgagccttc tgtcacgccc acataagggc 300
cgcttgaggg ctctttgggc aagtggtaac gccagtgtct gtgaaggcac ctgttactta 360
gcagaccgag aaagggagtc tcctttcctt ggaggagtca gggaacactc tgctccacca 420
gcttcttggt gaaggctgga tattatctag gcctgcccgc agtcatctgg aggcctaaac 480
ccctccctgt ggtgctgtgc ttcagtgggc actctccttg tccactttca tgttccctccc 540
gtactcctgg ttcctctttg aagtctgtag tagatagcag tagaagaaat agtgaaagtc 600
ttaaagtatt tgatctttct tataagtga tagaagaaaa cgctgacata tgctgccttc 660
tctatctctg cgggtggctac ctaaaagggg agggcccccgt gtcccatgat catgtgactt 720
gcttcacctt atcacttaga agattcattc tccttaccct gcgccccctc gtcttgatg 780
caataaatat cagcacgccc agtcgtttga ggccactgcc ggtctccgag tcttggtggt 840
agtggtcccc cgggcccagc tattgtctct ttatctcttt gtcttggtgc tttatttatt 900
acaatctctt gtctctgcac acagggagaa cacctgctaa gcccgtagg actggaccct 960
aca 963
```

<210> 46

<211> 397

<212> DNA

<213> Human endogenous retrovirus

<400> 46

```
aaacccctcc ctgtggtgct gtgcttcagt ggtcactctc cttgtccact ttcattgttcc 60
tcccgtaact ctggttcttc tttgaagttc gtagtagata gcagtagaag aaatagtga 120
agtcttaaag tatttgatct ttcttataag tgcatagaag aaaacgctga catatgctgc 180
cttctctatc tctgcggtgg ctacctaaaa gggaagggcc cctgtccca tgatcatgtg 240
acttgcttca ccttatcact tagaagattc atcctcctta cctgogccc cctcgtcttg 300
tatgcaataa atatcagcac gccagtcgt ttgaggccac tgccggtctc cgcgtcttgg 360
tggtagtggc ccccggggcc cagctattgt ctcttta 397
```

<210> 47

<211> 489

<212> DNA

<213> Human endogenous retrovirus

<400> 47

```
tgttcaattc tttgccttct acttttaaac ttaacttct cataaagcaa cctttttcaa 60
tcacctgtc cactctgact cattctgate acctgtcca cctgactca ttccgatcac 120
ctgatecact gtgactcatt ccgattaccc gctccaccct gactcattct gattctgatt 180
tctgctctg ccataaccat tttcccgc aaaccactca cctgtcact ctctttaaat 240
tagccaattg gaattagttt agcctgtgag gtctaaccct agccaatagg ggactgacac 300
agcagcaggg gccacatgtg tcaggaataa gacccccctt cctccctgt ccagatgtgt 360
gtccaccatt gctccatctg tgagggcaca cccttctata gaagtaaatt gccttgctga 420
gaagaaaaaa aagaacattt tatattcaag tcctatttct tttgctgcac cgaaacttta 480
tttataaca 489
```